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February 4, 2015

Omoruyi Patrick
Department of Toxic Substances Control
5796 Corporate Avenue
Cypress, CA 90630

Dear Mr. Patrick:

SUBJECT: REVISED SOIL AND GROUNDWATER REMEDIAL ACTION PLAN, SOUTHWEST MARINE TERMINAL ISLAND FACILITY, 985 SEASIDE AVENUE (BERTH 240), PORT OF LOS ANGELES, REMEDIAL ACTION ORDER NO. HAS-RAO 08/09-056

Enclosed please find the Revised Remedial Action Plan (RAP) for soil and groundwater remediation at the former Southwest Marine Terminal Island Facility, as required by Remedial Action Order No. HAS-RAO 08/09-056. This revised RAP addresses comments provided by the Department of Toxic Substances Control on September 18, 2014 and December 24, 2014.

If you require any additional information or have any questions regarding this matter, please contact Rita Brenner at (310) 732-3127 or via email at rbrenner@portla.org.

Sincerely,

CHRISTOPHER CANNON
Director of Environmental Management

CC:CJF:RB:mrx
ADP No.: 940228-625

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Ken Mattfeld, City of Los Angeles Harbor Department, City Attorney (w/enclosure)
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Enclosure

REVISED

SOIL AND GROUNDWATER REMEDIAL ACTION PLAN

Former Southwest Marine Property
985 Seaside Avenue
Terminal Island, California

ADP #050405-050

Prepared For:

City of Los Angeles Harbor Department
425 South Palos Verdes Street
San Pedro, California 90733

Prepared By:

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February 2015

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ACRONYMS

µg/kg	microgram per kilogram
µg/L	microgram per liter
ARAR	applicable or relevant and appropriate requirements
AS	air-sparge
BAE	BAE Systems Ship Repair, Inc.
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, xylenes
CalEPA	California Environmental Protection Agency
CAP	capping (surface capping technology)
CCC	criterion continuous concentration
CDDs	chlorinated dibenzo-p-dioxins
CDFs	chlorinated dibenzofurans
CDWR	California Department of Water Resources
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act of 1980, also known as Superfund: Amended in 1986 by the Superfund Amendments and Reauthorization Act (SARA)
CFR	Code of Federal Regulations
CHHSL	California Human Health Screening Level
chromium (VI)	hexavalent chromium
COC	contaminant of concern
COPC	chemical of potential concern
cPAH	carcinogenic polyaromatic hydrocarbon
CRWQCB	California Regional Water Quality Control Board
CSM	conceptual site model
CTR	California Toxics Rule
DHS	California Department of Health Services
DTSC	Department of Toxic Substances Control
ERMP	Environmental Risk Management Plan
ESL	environmental screening level
FS	Feasibility Study
GAC	granular activated carbon
GRA	General Response Action
GRO	gasoline range organics
Harbor Department	City of Los Angeles Harbor Department
HERO	Human and Ecological Risk Office
HHRA	Human Health Risk Assessment
H&S	Health and Safety
IC	institutional control

LIST OF ACRONYMS

ISCO	in-situ chemical oxidation
LARWQCB	Los Angeles Regional Water Quality Control Board
LTE	long-term effectiveness
LTM	long-term monitoring
MCL	maximum contaminant level
mg/kg	milligram per kilogram
mg/L	milligram per liter
MNA	monitoring for natural attenuation
MSL	mean sea level
ng/g	nanogram per gram
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
O&M	operation and maintenance
PCB	polychlorinated biphenyl
pg/L	picogram per liter
ppm	part per million
RAO	remedial action objective
RAP	Remedial Action Plan
RBCG	risk-based cleanup goal
RI	Remedial Investigation
SCAQMD	South Coast Air Quality Management District
SGI	The Source Group, Inc.
SSL	soil screening level
STE	short-term effectiveness
STLC	soluble threshold limit concentration
STM	short-term monitoring
SVOC	semi-volatile organic compound
SWRCB	California State Water Resources Control Board
TBA	tert-butyl alcohol
TBT	tributyltin oxide
TCDD	2,3,7,8-tetrachlorodibenzo-p-dioxin
TCE	trichloroethene
TEF	toxicity equivalency factors
TEQ	toxicity equivalents
TPH	total petroleum hydrocarbon
TRPH	total recoverable petroleum hydrocarbons
USEPA	United States Environmental Protection Agency
VOC	volatile organic compound
WDR	waste discharge requirements

1.0 INTRODUCTION

This *Remedial Action Plan* (RAP) was prepared for the Department of Toxic Substances Control (DTSC) on behalf of the City of Los Angeles Harbor Department (Harbor Department) to describe the proposed subsurface soil and groundwater remediation at the former Southwest Marine property (Site) located at Berth 240, 985 Seaside Avenue, Terminal Island, California (Figure 1). This RAP does not include remediation of harbor sediments. The Site has been subdivided into four parcels (Parcels 1, 2, 3, and 4) with Parcel 3 further subdivided into 3a (southern portion of Parcel 3) and 3b (northern portion of Parcel 3 currently occupied by SoCal Ship Services). The remediation of Parcel 3b is not included in this RAP because the site is currently occupied and an engineered cap is present and thus protects site workers.

The Site has been investigated and evaluated under the oversight of the DTSC in accordance with a Unilateral Order (Order) dated November 11, 2008. In accordance with the Order, the Harbor Department has completed all DTSC-required remedial investigations and has received approval of the following final documents:

- *Amended Remedial Investigation Report* (RI) (The Source Group, Inc. (SGI), January 31, 2012): approved by the DTSC on March 5, 2012;
- *Revised Human Health Risk Assessment and Ecological Screening Level Risk Evaluation* (HHRA) (SGI, April 19, 2013): approved by the DTSC on June 14, 2013; and
- *Final Feasibility Study (FS)* (SGI, January 24, 2014): submitted after DTSC comments of November 13, 2013: approved by the DTSC on March 24, 2014.

A *Removal Action Workplan* (RAW), for a portion of the Site, was prepared in May 2013 (SGI, May 15, 2013), in an effort to expedite soil remediation in an area planned for redevelopment by the Harbor Department. The RAW was reviewed and approved by the DTSC in August 2013 and was also conditionally approved by the United States Environmental Protection Agency (USEPA) in November 2013.

Fieldwork described in the RAW was implemented during the summer and fall of 2014 and entailed the removal of approximately 13,500 tons of PCB-, metal-, and hydrocarbon-contaminated soil present on Parcels 3a and the western portion of Parcel 2. Additional soil excavation will be required on Parcel 3a to remove residual concentrations of PCB remaining in the shallow soil. The completion of soil removal activities on Parcel 3a will be conducted during implementation of this RAP. Details of work completed during the execution of the RAW will be provided in the forthcoming *Removal Action Work Plan Completion Report.*

Excavation and off-site disposal/recycle for the soils and long-term monitoring of groundwater with monitored natural attenuation and institutional controls, as described in the *Final FS*, was determined to be the most cost- and technologically effective approach to achieving the established cleanup goals for the Site. Therefore, the proposed remedial action described in this RAP is consistent with the remedial actions recommended for the Site in the *Final FS*. In parallel with implementation of this proposed remedial action, the Harbor Department will continue to comply with the requirements of the Unilateral Order with the ultimate goal of completing all regulatory-required Site corrective activities.

In addition to the remedial alternatives presented in the *Final FS*, this RAP also proposes to establish institutional controls to reduce future potential exposure by site occupants to soil containing residual PCBs below the cleanup level, but above the industrial USEPA Regional Screening levels (RSLs), as requested by USEPA (Section 2.5), and to maintain existing mitigation measures in the northern portion of the Site currently occupied by SoCal Ship Services (Parcel 3b).

This document presents the methodologies of the proposed soil and groundwater remediation and confirmation sampling, supported by specific Health and Safety (Appendix A), Air Monitoring (Appendix B), Transportation (Appendix C), and Sampling and Analysis (Appendix D) Plans.

2.0 SITE BACKGROUND

The Site property is owned by the City of Los Angeles. From approximately 1981 to 2006, Southwest Marine operated ship repair, retrofit, and demolition operations at Berth 240, as the Southwest Marine Terminal Island Facility. Southwest Marine is now known as BAE Systems Ship Repair, Inc. (BAE). The Site is currently unoccupied with the exception of the SoCal Ship Services area in the northern portion of Parcel 3 (Parcel 3b). All manufacturing equipment and supplies associated with former Southwest Marine's operations have been removed. Only the vacant buildings remain, and the Site is frequently used as a filming location for television and motion picture production. Prior to Southwest Marine's tenancy at the property, Southwest Shipbuilding and Dry Dock Company used the Site as early as 1918. Southwest Shipbuilding Company occupied the Site until 1921. From 1921 to 1981, the Site was occupied by Southwest Shipbuilding Corporation, Ltd., Bethlehem Steel Company – Shipbuilding Division – San Pedro Yard, and Bethlehem Pacific Coast Steel Corporation. During the period prior to Southwest Marine's occupancy (1918-1981), the Site was a significant contributor to the naval war effort supporting both World War I and World War II.

Southwest Marine did not use the Site for shipbuilding, and its use of the Site was limited to ship repair, maintenance, and some ship demolition. When the nearby Naval Shipyard initially closed, Southwest Marine's operation experienced an increase in activity. This activity level (while modest in comparison to prior Site usage) began to decline in 1989 and continued throughout the remainder of its occupancy.

The Site has been subdivided into four primary parcels. Parcels 1, 2, and 3 were used for ship repair, machining, sandblasting and painting, woodwork, pipefitting, and other related support activities. Parcel 3 has been further subdivided into the southern, vacant parcel (Parcel 3a) and the northern occupied parcel (Parcel 3b). Parcel 4 is the former dry-dock area of the property. This RAP evaluates remedial actions for landside soils within Parcels 1, 2, and 3a, and groundwater.

Parcel 1 is located along Seaside Avenue in the eastern portion of the Site and contains several structures formerly used as machine shops, welding shops, an abrasive blasting room, a paint booth, hazardous waste accumulation points, warehouses and storage areas, an electrical power substation, and administrative offices (Figure 2).

Parcel 2 is located in the western portion of the Site along the Main Channel and contains a former paint booth and offices (Figure 3).

Parcel 3 is located north of Parcels 1 and 2, and was leased by Southwest Marine between 1981 and 1995. The southern, unoccupied portion of Parcel 3 (Parcel 3a) currently contains one structure (a former compressor building). The northern portion of Parcel 3 (Parcel 3b) is currently

leased and occupied by SoCal Ship Services. This area has an existing asphalt, paved cap with a plastic vapor barrier, and is outside of the Site boundaries included in this RAP.

Parcel 4, located south of Parcels 1 and 2, contains three piers, and was formerly used for dry-docking ships. The floating dry-docks have been dismantled and removed. Parcel 4 has been permitted as a near-shore, confined disposal facility and has been receiving sediment from various locations throughout the Los Angeles Harbor.

There are currently 16 groundwater monitoring wells at the Site: MW 1, MW 2, MW 4 through MW 8, MW-15 and MW-16 in Parcel 1; MW 9 through MW 13 in Parcel 2; and MW 3; and MW 14 in Parcel 3a. Beginning in 2005, groundwater monitoring wells have been sampled on a quarterly or semi-annual frequency. The Site is currently on a bi-annual groundwater monitoring and sampling schedule.

2.1 Surface Topography and Ground Cover

The Site is located on relatively flat-lying terrain at an approximate elevation of 10 feet above mean sea level (MSL) and is adjacent to San Pedro Bay. Adjacent land areas are also flat-lying at approximately the same elevation as the Site. The majority of the ground surface in Parcels 1 and 2 is paved or otherwise covered with structures. Although portions of Parcel 3a are paved (primarily in the on the eastern and southern areas), the majority of Parcel 3a is unpaved. Access to the unpaved portions of Parcel 3a is prohibited and a locked, chain-link fence isolates the area.

2.2 Geology

The property is located within the Los Angeles Coastal Plain of the Peninsular Ranges geomorphic province of southern California, approximately 17 miles south of downtown Los Angeles at the northern end of the Los Angeles Harbor. The Los Angeles Coastal Plain is a deep structural trough that has been filled primarily with unconsolidated Miocene through Recent age sediments or alluvium that are underlain by earlier Cenozoic bedrock. The Los Angeles Coastal Plain is bounded on the north by the Santa Monica Mountains; on the northeast by the low-lying Elysian, Repetto, Merced, and Puente Hills; on the east and southeast by the Santa Ana Mountains and San Joaquin Hills; on the south by the Palos Verdes Hills and the Pacific Ocean; and on the west by the Pacific Ocean.

Mapped sediments underlying the harbor consist of discontinuous sequences of clay, silt, and sand, which are interpreted to be Quaternary Beach Sediments. The Southwest Marine Terminal Island facility is constructed on fill material that was dredged from the nearby harbor channel. Except for minor improvements, the Site's physical characteristics and areal extent have not changed from the beginning of Southwest Marine's tenancy in 1981. Based upon a review of previous subsurface investigations and drilling for the remedial investigation, fill material underlying

the upper 20 feet of the Site is predominantly composed of light brown to dark gray poorly graded (well sorted), fine- to medium-grained sand with trace to five percent (%) silt and occasional gravel. Silt and gravel are occasionally noted up to 20% by volume and traces of fine shell fragments are noted throughout.

2.3 Hydrogeology

The Los Angeles Coastal Plain has been spatially divided by the California Department of Water Resources (DWR) into four groundwater basins (West Coast Basin, Central Basin, Santa Monica Basin, and Hollywood Basin) based on the hydrogeologic characteristics of the underlying strata and the locations of bounding geologic structures such as non-water-bearing rock and/or faults that impede groundwater movement. The subject property is located within the West Coast Basin, west of the Central Basin and south of the Santa Monica and Hollywood groundwater basins. The West Coast Basin is bordered on the east by the Newport-Inglewood Fault; on the west by Santa Monica Bay; on the north by the Ballona Gap (north of the Los Angeles International Airport), and on the south by the Palos Verdes Hills.

Based upon lateral distribution and varying hydrogeologic characteristics, five major aquifers have been identified in the geologic formations underlying the West Coast Basin (CDWR, 1961). The aquifers consist of (from oldest to youngest) the Silverado and Lynwood Aquifers of the San Pedro Formation, the Gage Aquifer of the Lakewood Formation, and the Gaspur and semiperched aquifers of the recent Holocene age Alluvium. In general, the older/deeper Silverado and Lynwood aquifers are currently designated as drinking-water sources and the younger/shallow aquifers (Gage, Gaspur, and semiperched) are not currently used for drinking-water purposes due to low yield and/or generally poor quality. Also, note that in the Los Angeles Regional Water Quality Control Board's (LARWQCB) August 28, 1998, Municipal and Domestic Water Supply (MUN) Policy Staff Report, the portion of the West Basin including the subject property has been de-designated and its underlying aquifers are no longer considered to be of beneficial use (LARWQCB, 1998).

Groundwater monitoring data indicate that depth to water typically ranges from 8 to 12 feet below top of casing, corresponding to elevations ranging from 2 to 3 feet above MSL. The groundwater gradient beneath the Site is generally flat in the northern portion of the Site and gradients, when evident, are interpreted to be transient and affected by tidal fluctuations.

2.4 Surface Water

Surface runoff is largely controlled by engineered drainage structures. Surface runoff is directed towards on-site storm-drains, which discharge into the Main Channel leading into the San Pedro Bay. Other than the San Pedro Bay of the Pacific Ocean, there are no surface water bodies within two miles of the Site.

2.5 Regulatory Background

Remedial investigations and feasibility studies have been conducted at the Site under DTSC oversight since issuance of the 2008 Unilateral Order. Concurrently with finalization of the HHRA and FS for the Site, in 2013 the Harbor Department also proposed the excavation of the western portion of the Site to accommodate a pending land use enhancement along the harbor waters. The May 15, 2013, *Removal Action Workplan* (RAW) which presented the proposed focused soil excavation was approved by DTSC on August 12, 2013 after a CEQA Negative Declaration. The scope of excavation listed in the 2013 RAW included the removal of soil containing PCBs under the Toxic Substances Control Act (TSCA) regulations, therefore the USEPA was notified, and on November 19, 2013, the USEPA conditionally approved implementation of the excavation activities. Due to project development planning difficulties, the planned RAW implementation was not conducted, and no soil excavation occurred in 2013 or 2014.

This RAP encompasses the whole Site (except Parcel 3b and harbor sediments, as described in Section 2.0). As the USEPA notification was specific to only the western part of the Site included in the RAW, the proposed Site-wide RAP implementation will require updated USEPA notification and approval. The previous USEPA conditional approval required that all soil containing PCB concentrations over 0.55 milligrams per kilogram (mg/kg) be classified as TSCA-regulated waste under 40 Code of Federal Regulations (CFR) 761.61(a)(5). In addition, USEPA required that institutional control(s) be implemented to prevent future potential exposure by site receptors to soil containing PCBs below the cleanup goal (0.55 mg/kg), but above the USEPA RSL for unrestricted land use of 0.22 mg/kg. Therefore, this RAP includes a section on institutional controls (Section 6.0).

3.0 REMOVAL ACTION OBJECTIVES AND CLEANUP GOALS

The *Final FS* included a discussion of chemical-specific, location-specific, and action-specific Applicable or Relevant and Appropriate Requirements (ARARs), and also proposed Remedial Action Objectives (RAOs):

The RAOs are:

Protection of the Environment

- Mitigate potential discharges of chemicals that could impact surface water;
- Maintain water quality, at a minimum, to objectives that are protective of ecological beneficial uses; and
- Prevent constituent soil concentrations from degrading groundwater in excess of State/Federal ecological risk levels applicable to Site use and setting.

Protection of Human Health

- Reduce and/or maintain human health risks to acceptable levels for industrial site use;
- Reduce and/or maintain human health risks (i.e., consumption of aquatic organisms exposed to chemicals migrating to water) to acceptable levels in surface water (ocean);
- Prevent soil-related exposures (i.e., incidental ingestion, direct dermal contact, and inhalation of either particulates or ambient air) to constituent concentrations exceeding a commercial/industrial land use designation cancer risk threshold of 1 x 10-6 and a non-cancer hazard index of 1; and
- Prevent inhalation of indoor air impacted by vapor-phase constituent concentrations, if present, that exceed a commercial/industrial land use designation cancer risk threshold of 1x 10-6 and a non-cancer hazard index of 1.

The Contaminants of Concern (COCs) were determined for each parcel, and are summarized below by parcel and by media:

Parcel 1

Soil Gas	No COCs identified
Soil	Metals (arsenic, cadmium, copper, lead, mercury, and zinc) TPH (C6 – C12, C13 – C24, C25 – C44)
Groundwater	Metals (arsenic and cobalt) TPH (C9 – C24, C25 – C44)

Parcel 2

Soil Gas	No COCs identified
Soil	Metals (antimony, arsenic, cadmium, chromium (VI), copper, lead, mercury, molybdenum, zinc) PCBs TPH (C6 – C12, C13 – C24, C25 – C44) Semi-volatile organic compounds (SVOCs; phenol) Triutyltin oxide
Groundwater	Metals (arsenic, copper, lead, nickel) TPH (C6 – C12, C9 – C24, C25 – C44) Volatile organic compounds (VOCs; naphthalene)

Parcel 3a-b

Soil Gas	No COCs identified
Soil	Metals (antimony, arsenic, cadmium, copper, chromium (VI), lead, mercury, molybdenum, nickel, silver, zinc) PCBs TPH (C13 – C24, C25 – C44) VOCs (benzene) SVOCs (phenol) Organochlorine pesticides (toxaphene) Dioxins/Furans (2,3,7,8-TCDD)
Groundwater	Metals (arsenic, barium, copper, lead, mercury, molybdenum, and nickel) TPH (C6 – C12, C13 – C24, C25 – C44) Dioxins/Furans (2,3,7,8-TCDD)

Based on the cleanup goals, COCs, and the known distribution of contaminants at the Site, soil and groundwater at the Site require remedial action. Figures 3 and 4 illustrate the areas of shallow and deep soil to be remediated. Figure 5 illustrates the location of the groundwater monitoring wells containing COC concentrations above cleanup levels.

The *Final FS* presented a list of soil cleanup goals, which were based on ARARs and site-specific human health risks-based goals. The proposed soil cleanup goals for COCs are listed on Table 1.

As recommended by the Department of Toxic Substances Control Human Health and Ecological Risk Office (DTSC-HERO), a 10-fold dilution following migration of groundwater into the harbor (surface water) was assumed for the final proposed groundwater cleanup goals. The proposed groundwater cleanup goals for COCs are listed on Table 1.

4.0 PROPOSED SOIL REMOVAL ACTION

Applicable technologies were screened in the *Final FS* based on criteria defined in the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) RI/FS guidance. Seven remedial alternatives, including the no action alternative, were considered, and these alternatives were compared using two "threshold" criteria: overall protection of human health and the environment and compliance with ARARs; and five "balancing" criteria: long-term effectiveness, reduction of toxicity, mobility or volume, short-term effectiveness, implementability, and costs. In addition to the "threshold" and "balancing" criteria, the two "modifying" criteria of State acceptance and Community acceptance were considered. The State acceptance criterion was met with the concurrence by the DTSC of the remedial strategy outlined in the Final FS. The Community acceptance criterion will be met upon completion of the public participation portion of the project to be completed prior to RAP implementation. The strongest remedial alternatives were then compared based on these criteria.

Based on the above criteria, excavation with off-site disposal/recycling for the soil and long-term monitoring of groundwater with monitored natural attenuation and institutional controls (Alternative No. 4) was selected as the preferred remedial alternative. In conjunction with monitoring, following the completion of soil removal activities, post-remediation monitoring of groundwater quality will be used to evaluate whether active remediation of groundwater, in limited areas, may be warranted. Selected groundwater remediation alternatives may include air-sparging to reduce dissolved TPH concentrations, and/or calcium polysulfide injection to address soluble metals. Any active groundwater remedial alternatives will be selected based on need, effectiveness, implementability, and cost.

The selected remediation addresses all COCs in soil by excavation and off-site disposal or recycling and it protects both human and ecological exposure pathways from the primary source areas in on-site soil. Removal of COCs with the soil eliminates the primary transport mechanisms to potential receptors and leaves a greatly reduced list of COCs in the secondary source of on-site groundwater impact.

The selected remedial methods apply across all three parcels with the exception of Parcel 3b, which is currently occupied by SoCal Ship Services and cannot be actively remediated at this time. Groundwater monitoring will be established on Parcel 3b, if required by the DTSC, and the RAP includes a review of existing institutional controls at Parcel 3b. Active remediation at Parcel 3b can be deferred until that area of the property is unoccupied, provided there are sufficient institutional and engineering controls, and monitoring, to protect human exposure.

None of the historic building or structures are expected to be removed as part of this remedial action; some small excavations will occur inside buildings.

The proposed excavation is expected to extend no deeper than the tidal zone/capillary fringe as needed. Soils will be segregated, analyzed, characterized for disposal, and sent for off-site treatment or reuse, as described in the following sections.

4.1 Excavation

Prior to excavation, several tasks will be implemented to ensure the safety, effectiveness, and proper documentation of the proposed remediation.

4.1.1 Utility Clearance and Well Decommissioning

Once all excavation areas are marked, Underground Services Alert (USA) will be contacted and a ticket number obtained. The USA ticket will remain active during all phases of subsurface excavation or any intrusive activities.

A site-wide geophysical survey will be completed in the areas proposed for excavation. The objective of this survey will be to determine whether buried structures or other interferences to excavation are present. During the survey, identified structures will be marked on the ground, and designated as to whether the structure is a storm drain (green), water line (blue), electrical conduit (red), natural gas line (yellow), or unknown (white). The structures will also be mapped and compared to existing infrastructure maps to ensure that, to the extent practical, all buried infrastructure are identified prior to the initiation of intrusive work.

Four groundwater monitoring wells (MW-1, MW-2, MW-10, and MW-13) located in areas of targeted deep excavation will require decommissioning prior to the soil excavation described in this RAP. The wells will be abandoned in accordance with a well decommissioning permit obtained from the Los Angeles County Public Works Department. Additionally, two monitoring wells (MW-4 and MW-9) located in areas of the proposed shallow soil excavation will be temporarily modified by lowering the casing to a depth of three feet below current grade. At the conclusion of remedial actions described in this RAP, the network of monitoring wells will be evaluated and a proposed revised groundwater monitoring program will be submitted to the DTSC for approval.

4.1.2 Site Preparation

The location of all proposed excavation areas will be pre-marked by a survey crew. Existing survey data will be used to ensure that planned excavation areas are centered on known contaminated areas. The bounds of the proposed excavation areas will be maintained and used to generate as-built maps at the completion of the removal of soil and to track the expansion of excavations should confirmations soil samples indicate that additional soil removal is required to achieve Site cleanup goals.

VOCs have not been detected at the Site in soil in excess of 50 parts per million, when measured in the field with a organic vapor analyzer. Therefore, the use of a South Coast Air Quality Management (SCAQMD) Rule 1166 permit is not expected to be required during the excavation and handling of soil. However, as part of SGI's health and safety monitoring program, a photoionization detector will be used to measure the concentrations of VOCs during soil excavation activities. In the event that soil containing VOCs in excess of 50 ppm (as defined in Rule 1166) are encountered, the SCAQMD will be contacted and a Rule 1166 permit will be activated and followed.

Due to the redevelopment, modifications to the Site surface or pavement are expected. Unless the surface pavement is concrete, no pre-excavation saw cutting of the excavation areas is proposed. Similarly, once excavations have been completed, clean import soil be used to fill the excavations to match surface grade; no asphalt paving will be replaced.

The area selected for temporary stockpiling of soil prior to off-site disposal may require some pavement repair or upgrade to facilitate soil handling. Storm water controls and dust mitigation best management practices (BMPs) will also be implemented.

4.1.3 Health and Safety Planning

The site-specific health and safety plan (HASP – Appendix A), prepared in accordance with federal (29 CFR 1910.120) and State (California Code of Regulations, [C.C.R.] Title 8, Section 5192) describes methods for protection of site workers and visitors during the remedial activities. The following information is contained in the HASP:

- List of COCs, their characteristics, and potential exposure routes;
- Action levels for various COCs;
- Methods for field monitoring of COCs;
- Emergency procedures and contact information;
- Identification and routes to emergency facilities;
- Identification of potential physical hazards and response actions for specific remedial tasks (job hazard analyses); and
- Personal protective equipment (PPE) for specific remedial tasks.

PPE will generally consist of Level D equipment, including hard hats, steel-toed boots, ear protection, eye protection, and reflective orange vests. Respiratory protection is not anticipated, but will be available should particulate dust or vapor monitoring indicate such precautions are necessary. Particulate dust monitoring is detailed in Air Monitoring Plan (Appendix B).

Adequate protection shall be provided to protect personnel from loose rock or soil that could pose a hazard by falling, toppling, or sliding from an excavation face. Such protection shall consist of scaling to remove loose material; installation of protective barricades at intervals as necessary on the face to stop and contain falling material; or other means that provide equivalent protection.

In addition, personnel shall be protected from excavated or other materials or equipment that could pose a hazard by falling or rolling into excavations. Protection shall be provided by placing and keeping such materials or equipment at least 2 feet from the edge of excavations, or by the use of retaining devices that are sufficient to prevent materials or equipment from falling or rolling into excavation, or by a combination of both if necessary.

Air monitoring procedures are described in Appendix B.

4.1.4 Regulatory Notification and Additional Investigation

The removal of soil containing PCBs will require notification of the USEPA's TSCA coordinator. This RAP, once approved by DTSC, will be forwarded to the USEPA as an addendum to the Notification sent in 2013 for the initially planned excavation of the western portions of the Site. Specific TSCA notification to the USEPA will also be required to be filed by the waste transporter and disposal contractor. A public comment period for this proposed RAP, in accordance with CEQA, will also be required prior to implementation of any remediation activities.

The USEPA indicated that additional soil sampling would be required at six locations in the western part of the Site at the surface and at 2-foot depth, and this sampling for PCBs will be conducted to satisfy that requirement.

4.1.5 Excavations

Planned activities consist of shallow (0 to 2 feet below grade) and deep (2 to 10 feet below grade) excavations (Figures 3 and 4). The purpose of the proposed excavations is to remove soil containing contaminants with concentrations above the cleanup goals. Current excavation plans do not anticipate that shoring of any excavation will be required; the deeper excavations will be step-sloped or benched. Soil and groundwater (if any) removed during this process will be disposed of off-site. After removal of contaminated soil and completion of confirmation sampling, all excavations will be backfilled and graded.

The USEPA's November 2013 conditional approval of the initially proposed interim soil removal indicated that all excavated soil containing PCBs over 0.55 mg/kg be classified as a TSCA regulated waste, requiring disposal at a facility authorized to accept such wastes. The distribution of PCBs in soil known from previous in-situ sampling and testing indicates that among areas scheduled for excavation as part of this RAP, most proposed excavation areas in the western part of the Site may contain PCBs over 0.55 mg/kg, and the soil excavated from these areas will be

transported and disposed of as TSCA regulated waste. Figure 3A, 3B, and 4 depict those areas in the central and eastern parts of the Site that, based on previous sampling, are not expected to contain PCBs at concentrations over 0.55 mg/kg.

4.2 Soil Removal, Stockpiling, and Waste Classification

Soil removed from the excavations in the western part of the Site as shown on Figure 3A, 3B, and 4 will be characterized as TSCA-regulated waste in accordance with the USEPA's November 19, 2013, directive. Soil removed from the four areas known to contain PCB concentrations over 50 mg/kg at sample locations DP-49-1 FT, P2-7R-2 FT, SBP3-19-3 IN and SBP3-22-3 IN, will be direct-loaded for disposal as TSCA regulated (hazardous) waste. The soil removed from the western areas containing PCBs <50 mg/kg and >0.55 mg/kg will be stockpiled and further tested for other waste characteristics prior to transportation and disposal within 90 days of excavation.

Soil removed from the central and eastern areas as shown on Figure 3A, 3B, and 4 will be stockpiled and tested for PCBs to verify that the soil does not contain PCBs over 0.55 mg/kg and therefore is not classified as TSCA-regulated soil waste, in addition to the testing for other waste characteristics.

Soil will be excavated and temporarily stockpiled on plastic sheeting and covered with plastic sheeting. The stockpiles will be labeled, sampled for waste classification, profiled for waste disposal or treatment, and hauled from the site within regulatory time limits for disposal or treatment.

The frequency of stockpile sampling or set of stockpiles from the same excavation will be as follows:

- One sample will be collected from stockpiles less than 100 cubic yards;
- Three samples will be collected from stockpiles less than 500 cubic yards;
- Five samples will be collected from stockpiles totaling up to 1,000 cubic yards;
- Five soil samples for the first 1,000 cubic yards and one sample for each additional 500 cubic yards in a stockpile containing up to 5,000 cubic yards; and
- Thirteen samples for the first 5,000 cubic yards and one sample for each additional 1,000 cubic yards in stockpiles greater than 5,000 cubic yards.

The sample analytical protocol for waste soil shall include (at a minimum) analyses for total petroleum hydrocarbon by EPA Method 8015M (hydrocarbon chain), semi-volatile organic compounds by EPA Method 8270, volatile organic compounds by EPA Method 8260B, California Assessment Metals by EPA Method 6010/7471 series. Soil piles from the central and eastern excavations (Figure 3A, 3B, and 4) will be tested for PCBs by USEPA Methods 3540C/8082A as

directed by the USEPA. Based on the initial metals analytical results, soil samples will be additionally characterized by soluble threshold limit concentration (STLC) and/or toxicity characteristic leaching procedure (TCLP) methodologies, if necessary (e.g., total threshold limit concentration – TTLC results exceed ten times the STLC standard).

4.3 Transportation and Disposal of Soil

During the remediation of all parcels included in this RAP, exclusive of soil previously removed during the execution of the 2014 RAW, approximately 15,200 tons soil are expected to be excavated and hauled from the site. Estimated soil masses are:

- 3,400 tons from Parcel 1;
- 4,100 tons from Parcel 2; and
- 7,700 tons from Parcel 3a.

Soil containing concentrations of metals and TPH in excess of cleanup goals, but with concentrations of PCBs below 0.55 mg/kg, will be excavated, transported, and disposed of as a California-only hazardous waste. No RCRA levels of metals or other constituents of concern are expected to be present in excavated soil and thus no Class I disposal of soils is anticipated.

Following anticipated approval and in accordance with TSCA requirements by USEPA concerning PCB-containing soil, all soils (approximately 6,100 tons containing PCBs above 0.55 mg/kg will be transported and disposed of as a TSCA (40 CFR 761.61(a)(5)) waste at the US Ecology landfill in Beatty, Nevada or at the Chemical Waste Management facility in Kettleman Hills, California

The transportation plan (TP; Appendix C) provides specific details for offsite material hauling. Onsite traffic control includes truck staging, speed control, truck routes, and entry/exit locations. Procedures for managing onsite truck traffic are further detailed in the TP, including the flag person responsibilities. The TP contains procedures for hauling and offsite disposal of excavated materials. The TP includes procedures for covering loads, manifesting, and transportation routes to the selected offsite disposal facilities.

4.4 Confirmation Sampling

The collection and analyses of post-excavation confirmation samples and stockpile confirmation samples are outlined in detail in Appendix D. Sidewall samples will be collected every 25 linear feet, and excavation bottom samples will be collected following a set of a 10 feet by 10 feet grid cells as described in Appendix D. Each excavation will be sampled at least along the four cardinal direction sidewalls, and at least one excavation floor sample will be collected, resulting in a minimum of 5 samples per excavation. Quality Control/quality assurance samples, including field duplicates samples will be collected and analyzed, as described in Section 8 of Appendix D. Split samples for agency verification will also be provided, if requested.

All confirmation samples will be analyzed for total petroleum hydrocarbon, speciated by carbon chain range using, EPA Method 8015, for metals by EPA Method 6010, and for PCBs by EPA Methods 3540C/ 8082A, as described in Appendix D.

4.5 Excavation Backfilling

Excavation backfilling will be conducted after confirmation analytical results have been transmitted to and reviewed by the DTSC. With DTSC concurrence that backfilling can commence, clean fill will be brought onto the Site. The backfill material will be from a source known to meet Harbor Department standards for import fill (e.g., Hansen Material in Irwindale, California). Deeper excavations will be backfilled with 3/4-inch gravel from the bottom of the excavation to approximately 6 feet below ground surface (bgs). At approximately 6 feet bgs, a geotextile layer will be placed, followed by placement of silty sand to the ground surface. The silty sand will be compacted to a minimum of 90 percent in two-foot lifts.

4.6 Best Management Practices

Detailed procedures on air monitoring, health and safety, transportation, and soil confirmation sampling and analysis are presented in individual plans included as Appendices:

Appendix A	Health and Safety Plan
Appendix B	Air Monitoring Plan
Appendix C	Transportation Plan
Appendix D	Sampling and Analysis Plan

4.7 Reporting

A report on soil excavation and disposal will be provided to the DTSC and USEPA within 90 days of completion of soil removal. In addition, preliminary confirmation sample results will be communicated to DTSC and USEPA to allow for effective field decisions on lateral or vertical expansions of excavations or step-out sampling.

5.0 PARCEL 3B SITE MANAGEMENT

The northern site parcel, Parcel 3b, is currently actively occupied by a commercial operation, and soil excavation is not currently an option. This area of the Site has been mitigated by engineering and institutional controls. Site operations are limited to the receipt, temporary storage, and transloading of material to and from ships located within and outside of San Pedro harbor. During the course of these operations no subsurface disturbances are required. Further, as the property owner, the Harbor Department must approve any proposed site improvements by the tenant.

As part of the approval process, known as an application for port permit (APP), the site tenant must provide detailed plans to the Harbor Department for any site improvements or renovations. In conjunction with this permitting process, Harbor Department Environmental Management Division (EMD) must review and approve the proposed site activities. Accordingly, EMD staff will scrutinize any proposed work that may entail disturbance of the surface pavement or the installation of borings or excavations. Activities that could potentially disturb site contaminants will either be prohibited or will be permitted only with requisite mitigation measures.

The Harbor Department will provide written notification to the DTSC each time that the EMD receives an APP from the Parcel 3b tenant that entails activities that will disturb the surface pavement or require the installation of soil borings and/or excavations.

As part of the RAP implementation, the Harbor Department will review the existing institutional and engineering controls, and will provide DTSC an updated Interim Mitigation Plan that will include a description of the controls, a schedule for monitoring and reporting on the controls, and a proposed groundwater monitoring program for that parcel.

6.0 DEED RESTRICTION

As part of the proposed Site remedy, usage restrictions will be imposed in the form of institutional controls to (1) limit the Site to commercial or industrial usage, and (2) record the requirement to implement remedial action at Parcel 3b in the future.

7.0 PROPOSED GROUNDWATER REMEDIAL ACTION PLAN

The *Final FS* presented the proposed groundwater cleanup goals (Table 1). The COCs in groundwater do not pose significant risks to human health at the detected concentrations. Further, site studies have demonstrated that groundwater at the site is not in active communication with Harbor Waters (a seawall borders the western portion of the site and isolates groundwater from Harbor Waters). The proposed dissolved TPH cleanup goal is based on drinking water protection standards with no human or ecological screening values. The proposed dissolved metals cleanup goals are based on ecological screening levels. Based on concentration, distribution, and risk of associated with the individual COC known to be present at the Site, groundwater monitoring to demonstrate natural attenuation for the residual concentrations of Site constituents is preferred over active site-wide groundwater remediation. Additionally, no single remedial alternative evaluated in the *Final FS* addresses all COCs in groundwater due to the varied chemical properties of dissolved metals and TPH. Air-sparge technology may be implemented if needed for TPH in groundwater. For soluble metals, calcium polysulfide injection may be implemented for aggressive COC-specific source reduction, if needed.

Figure 5 illustrates the location of the monitoring wells from which the most recent groundwater monitoring sample contained contaminant(s) concentration(s) above the cleanup goal as listed on Table 1.

The groundwater remedial alternatives were evaluated in the *Final FS*, and the selected remedial alternative, short-term groundwater monitoring for metal concentrations, was found to satisfy the remedial alternative selection criteria as follows:

- *Overall Protection of Human Health and the Environment.* The selected alternative would monitor dissolved metal trends in groundwater and allow additional investigation of intrinsic remediation and of potential ecological impacts to surface water and the environment.
- *Compliance with ARARs.* The selected alternative minimizes potential direct exposure per the ARAR requirements in "hot spot" areas. The approach would allow additional study of possible intrinsic remediation in groundwater site-wide for contaminants left in place and evaluation of ecological risk if any.
- *Long-Term Effectiveness.* Monitoring would be used for remediation verification, but also to determine the actual degradation and/or migration of contaminants. These persistent COCs can be monitored to document natural degradation of groundwater impacts and potential for ecological impact. The long-term reliability of the alternative is considered good to moderate.

- *Reduction of Toxicity, Mobility, or Volume.* Contaminant reduction will occur slowly by intrinsic biodegradation, dilution, and dispersion over a long period. Some of the most persistent COCs may migrate to surface waters before degrading.
- *Short-Term Effectiveness.* Harbor Department water quality data indicate no exiting impacts to harbor waters and ecology to date. The potential short-term risk of the selected alternative is considered moderate.
- *Implementability and Costs.* The selected alternative would primarily involve monitoring and construction activities to sample and maintain wells and will require covenants or deed restrictions to be negotiated with the property owner(s) and lease agreements to be imposed on future tenant(s).

The implementation of the groundwater monitoring program will consist of the following:

- Continued monitoring of groundwater for metals and TPH following current schedule;
- Abandonment or protection of wells in the proposed excavation areas;
- After completion of soil removal, evaluation of the network of monitoring wells and the future site buildings layout, and preparation of a monitoring program workplan, including, as feasible, the installation and monitoring of wells in Parcels 3a and 3b; and
- Groundwater monitoring of the updated monitoring well network for a period of 2 years after soil removal or final well network installation.

8.0 PROJECT SCHEDULE

The implementation of the project will be based on regulatory approval, and schedule requirements associated with the proposed site redevelopment. Current site usage does not result in significant exposure by site occupants to subsurface contaminants, and no significant further groundwater degradation is expected to be occurring.

The RAP implementation is expected to occur under the following project schedule:

TASK	DATE
RAP Submittal	July 2014
DTSC RAP Comments	September 2014
Submittal of Revised RAP	February 2015
DTSC RAP Approval	March 2015
Remedial Design (60 days after RAP Approval- 60 days for DTSC review)	May 2015
Western Area RAW Preparatory Activities: Notification of USEPA, Monitoring Well Abandonment/Protection	*Completed* - August 2014
Preparation of Negative Declaration and Public Comment period for RAP	May – June 2015
Western Area RAW Implementation: Parcels 2 and 3a / Pavement Preparation for Stockpiling and BMPs	*Completed* - September – December 2014
Preparation of RAW Completion Report	January – March 2015
RAP Preparatory Activities: Northern Part of 3a; Additional Removal of Soil in Parcels 3a eastern Part of Parcel 2, and Parcel 1	April –July 2015
RAP Implementation: Northern Part of 3a; Additional Removal of Soil in Parcels 3a eastern Part of Parcel 2, and Parcel 1	August – December 2015
Final Remedial Activities Completion Report	February 2016
Finalization of Parcel 3 B Mitigation Plan	Spring 2016
Finalization of Property Development Plans	Spring 2016
Updated Groundwater Monitoring Program Work Plan	Spring 2016
Deed Restrictions	NA
Installation of Network of Groundwater Monitoring Wells / Implementation of Groundwater Monitoring	2016-2017 (2 years)

9.0 REFERENCES

Department of Toxic Substances Control, 2012 *Approval Letter for Amended Remedial Investigation Report, Former SW Marine Property,* March 5

Department of Toxic Substances Control, 2013 *Approval Letter for Revised Human Health Risk Assessment and Ecological Screening Level Risk Evaluation, Former SW Marine Property,* June 14

Department of Toxic Substances Control, 2013 *Approval Letter for Removal Action Workplan, and the California Environmental Quality Act (CEQA) Negative Declaration, Former SW Marine Property,* August 12

Department of Toxic Substances Control, 2014 *Approval Letter for Final Feasibility Study, Former SW Marine Property,* March 24

The Source Group, Inc, 2012. *Amended Remedial Investigation Report, Former SW Marine Property,* January 30.

The Source Group, Inc., 2013a. *Revised Human Health Risk Assessment and Ecological Screening Level Risk Evaluation* (HHRA), *Former SW Marine Property,* April 19

The Source Group, Inc., 2013b. *Removal Action Workplan, Former SW Marine Property*, May 15

The Source Group, Inc., 2013c. *Final Revised Feasibility Study, Former Southwest Marine Property*, September 30.

The Source Group, Inc., 2014. *Final Feasibility Study, Former Southwest Marine Property*, January 24.

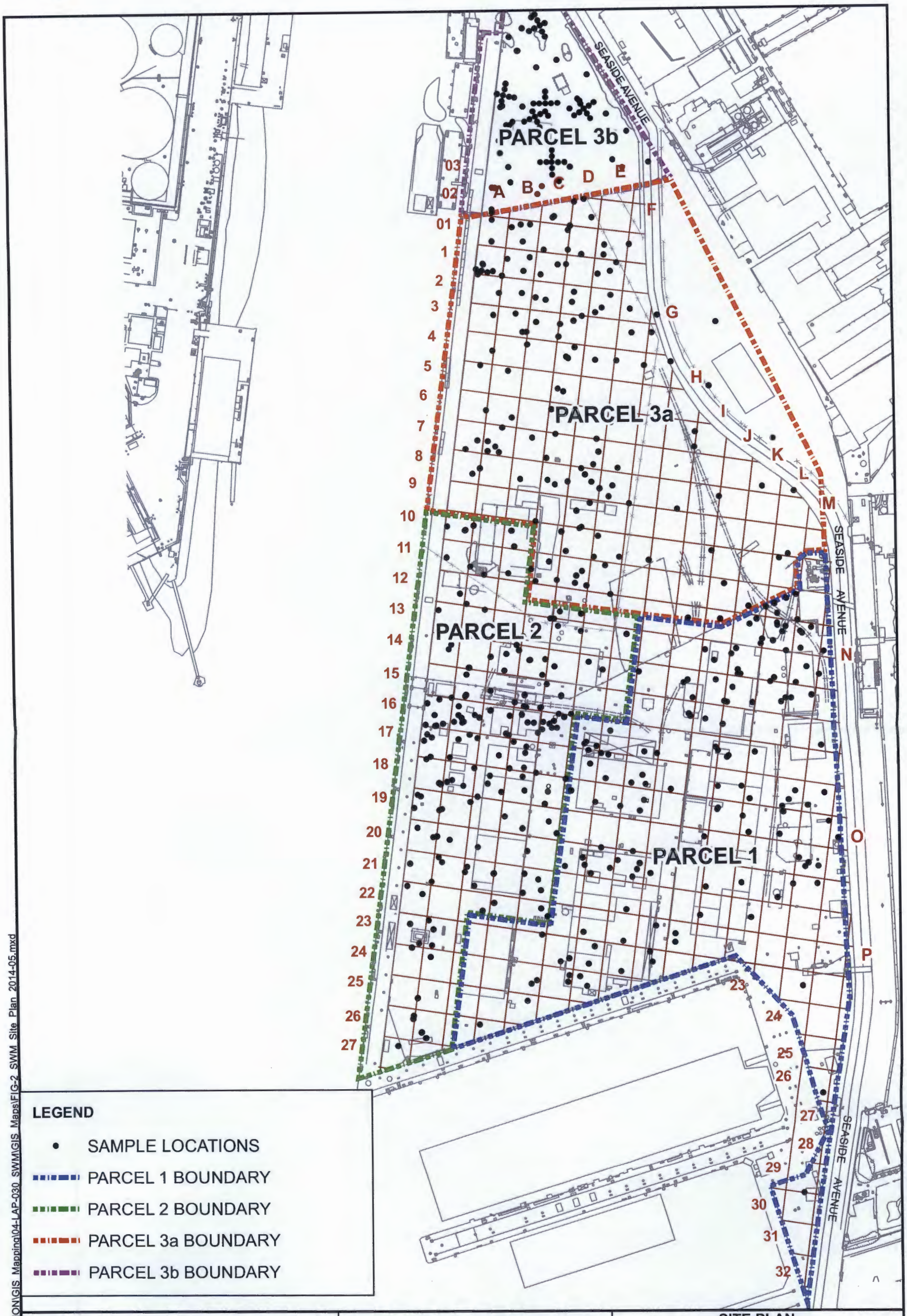
USEPA, 2013. *Polychlorinated Biphenyls Cleanup Under the TSCA at the Former Southwest Marine Facility*, November 19

10.0 LIMITATIONS

This document was prepared for the exclusive use of the City of Los Angeles Harbor Department (Harbor Dept.) and the Department of Toxic Substances Control (DTSC) and US Environmental Protection Agency (USEPA) for the express purpose of complying with a client- or regulatory directive for environmental investigation or restoration. SGI and Harbor Dept. must approve any re-use of this work product in whole or in part for a different purpose or by others in writing. If any such unauthorized use occurs, it shall be at the user's sole risk without liability to SGI or Harbor Dept. To the extent that this report is based on information provided to SGI by third parties, including Harbor Dept., their direct contractors, previous workers, and other stakeholders, SGI cannot guarantee the completeness or accuracy of this information, even where efforts were made to verify third-party information. SGI has exercised professional judgment to collect and present findings and opinions of a scientific and technical nature. The opinions expressed are based on the conditions of the Site existing at the time of the field investigation, current regulatory requirements, and any specified assumptions. The presented findings and recommendations in this report are intended to be taken in their entirety to assist Harbor Dept. and DTSC and USEPA personnel in applying their own professional judgment in making decisions related to the property. SGI cannot provide conclusions on environmental conditions outside the completed scope of work. SGI cannot guarantee that future conditions will not change and affect the validity of the presented conclusions and recommended work. No warranty or guarantee, whether expressed or implied, is made with respect to the data or the reported findings, observations, conclusions, and recommendations.

FIGURES

SOURCE: ESRI 7.5 MINUTE TOPOGRAPHIC MAP. http://resources.esri.com/arcgisonlineservices	PROJECT NO.: 04-LAP-030	DATE: 5/14/14	DR.BY: JK	APP.BY: PP	SCALE= 1:24,000 0 875 1,750 3,500 Feet	N
SGI environmental THE SOURCE GROUP, INC. 1962 FREEMAN AVENUE SIGNAL HILL, CA 90755 (562)597-1055	**Former Southwest Marine Terminal** 985 Seaside Avenue Terminal Island, California 90731				**SITE LOCATION MAP**	FIGURE 1



NOTES:

FORMER SOUTHWEST MARINE FACILITY
TERMINAL ISLAND, CALIFORNIA

SITE PLAN AND SAMPLE LOCATIONS

PROJECT NO.:	DATE:	DR.BY:	APP. BY:
04-LAP-028	5/27/2014	J. KURASHIGE	P. PARMENTIER

0 50 100 200 Feet

SGI environmental THE SOURCE GROUP, INC.
1962 FREEMAN AVE.
SIGNAL HILL, CA 90755
(562) 579-1055

N

FIGURE 2

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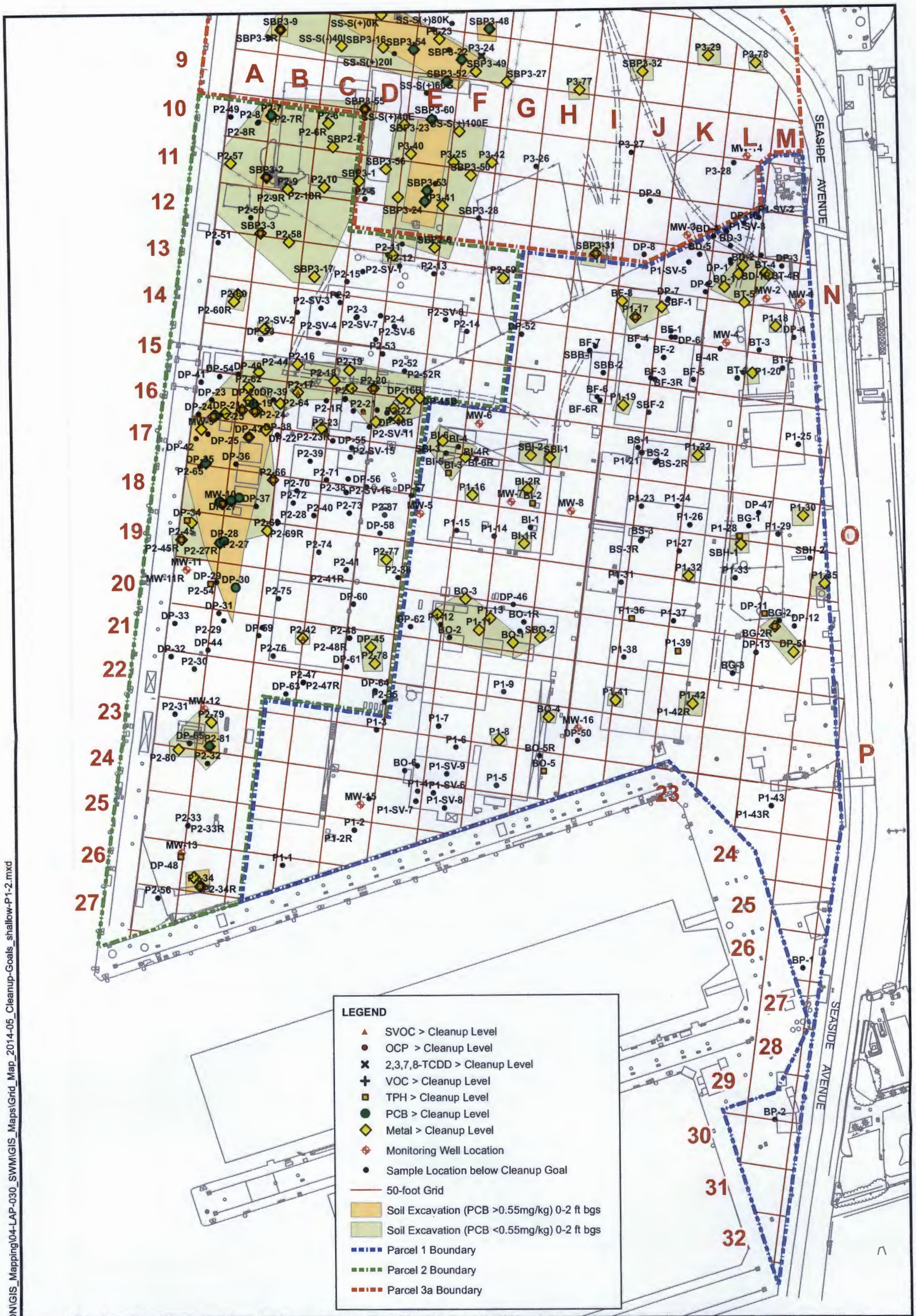

NOTES:

SVOC - Semivolatile Organic Compounds
OCP - Organochlorine Pesticides
2,3,7,8-TCDD - 2,3,7,8-tetrachlorodibenzo-p-dioxin
VOCs - Volatile Organic Compounds
TPH - Total Petroleum Hydrocarbons
PCB - Polychlorinated Biphenyls
Metals - Antimony, Arsenic, Barium, Cadmium, Chromium VI, Cobalt, Copper, Lead, Mercury, Molybdenum, Nickel, Silver, Zinc

FORMER SOUTHWEST MARINE FACILITY

TERMINAL ISLAND, CALIFORNIA

PROJECT NO.:	DATE:	DR.BY:	APP. BY:
04-LAP-028	5/28/2014	J. KURASHIGE	P. PARMENTIER

0 50 100 200 Feet

SHALLOW SOIL AREAS ABOVE CLEANUP LEVELS (PARCELS 1 AND 2)

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1962 FREEMAN AVE.
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(562) 579-1055

N

FIGURE 3A

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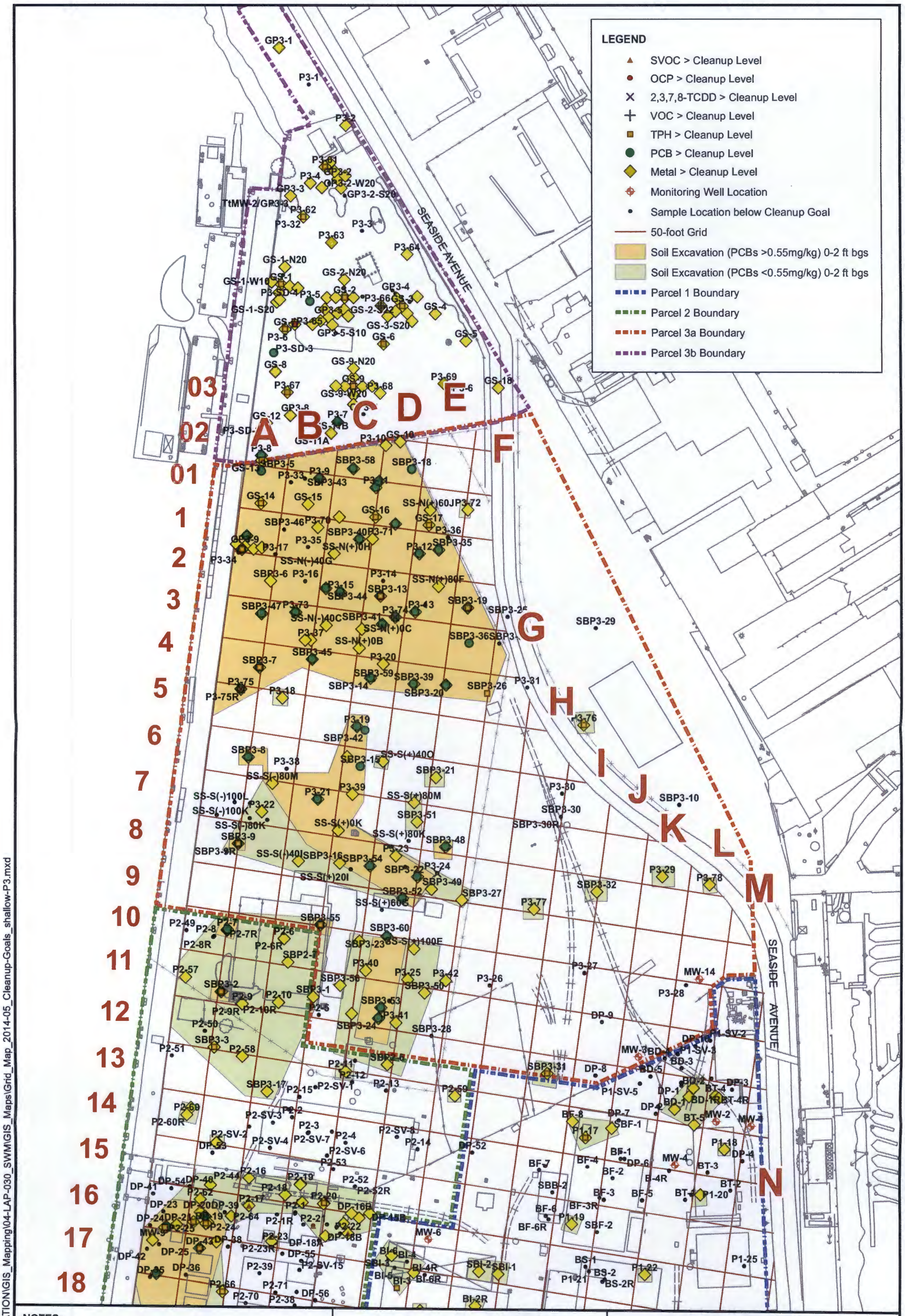

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FORMER SOUTHWEST MARINE FACILITY
TERMINAL ISLAND, CALIFORNIA

SHALLOW SOIL AREAS ABOVE CLEANUP LEVELS (PARCEL 3)

PROJECT NO.:	DATE:	DR.BY:	APP. BY:
04-LAP-028	5/28/2014	J. KURASHIGE	P. PARMENTIER

0 50 100 200 Feet

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1962 FREEMAN AVE.
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(562) 579-1055

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FIGURE 3B

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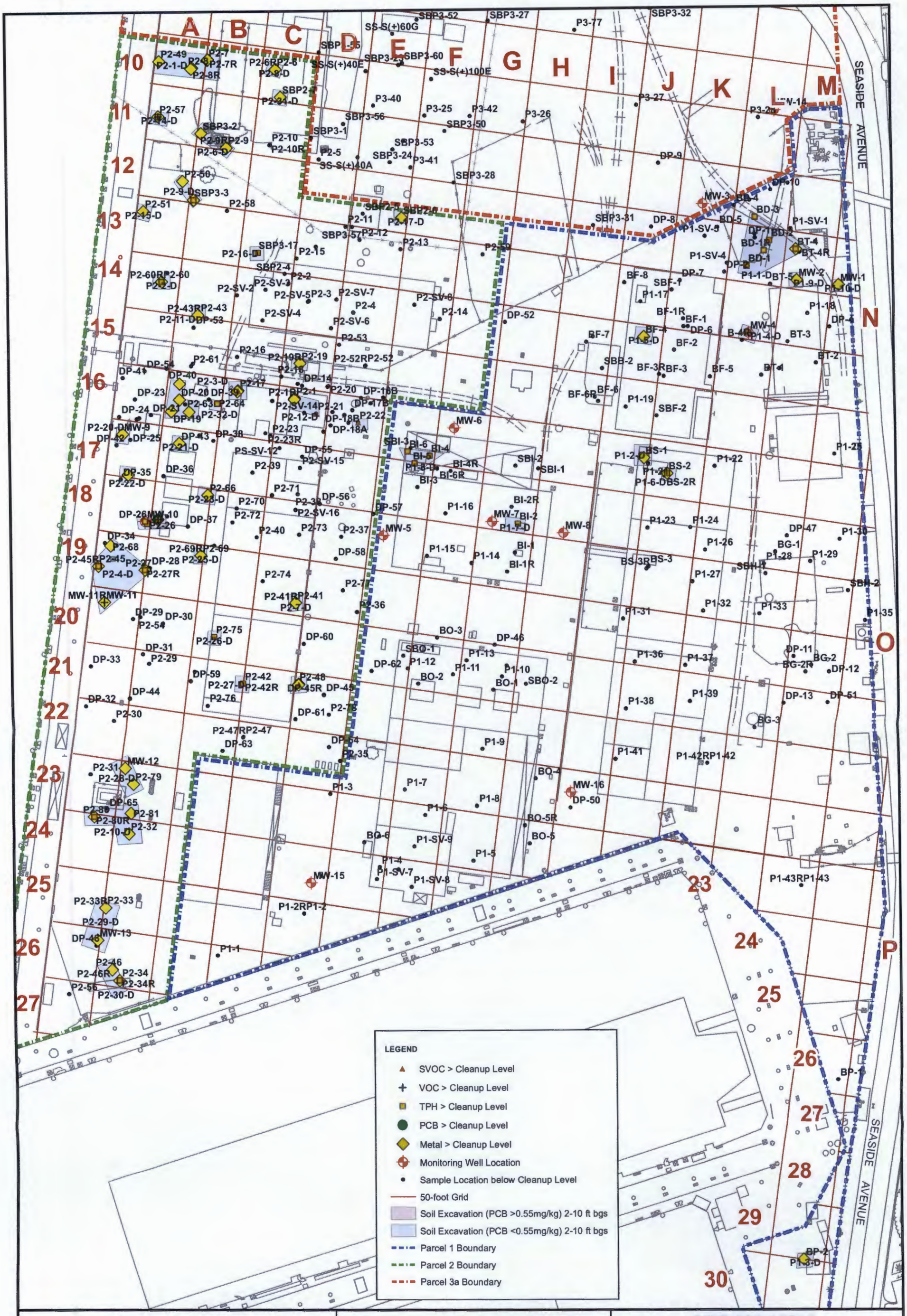

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FORMER SOUTHWEST MARINE FACILITY
TERMINAL ISLAND, CALIFORNIA

PROJECT NO.:	DATE:	DR.BY:	APP. BY:
04-LAP-028	5/28/2014	J. KURASHIGE	P. PARMENTIER

0 50 100 200 Feet

DEEP SOIL AREAS ABOVE CLEANUP LEVELS (PARCELS 1 AND 2)

SGI environmental THE SOURCE GROUP, INC.
1962 FREEMAN AVE.
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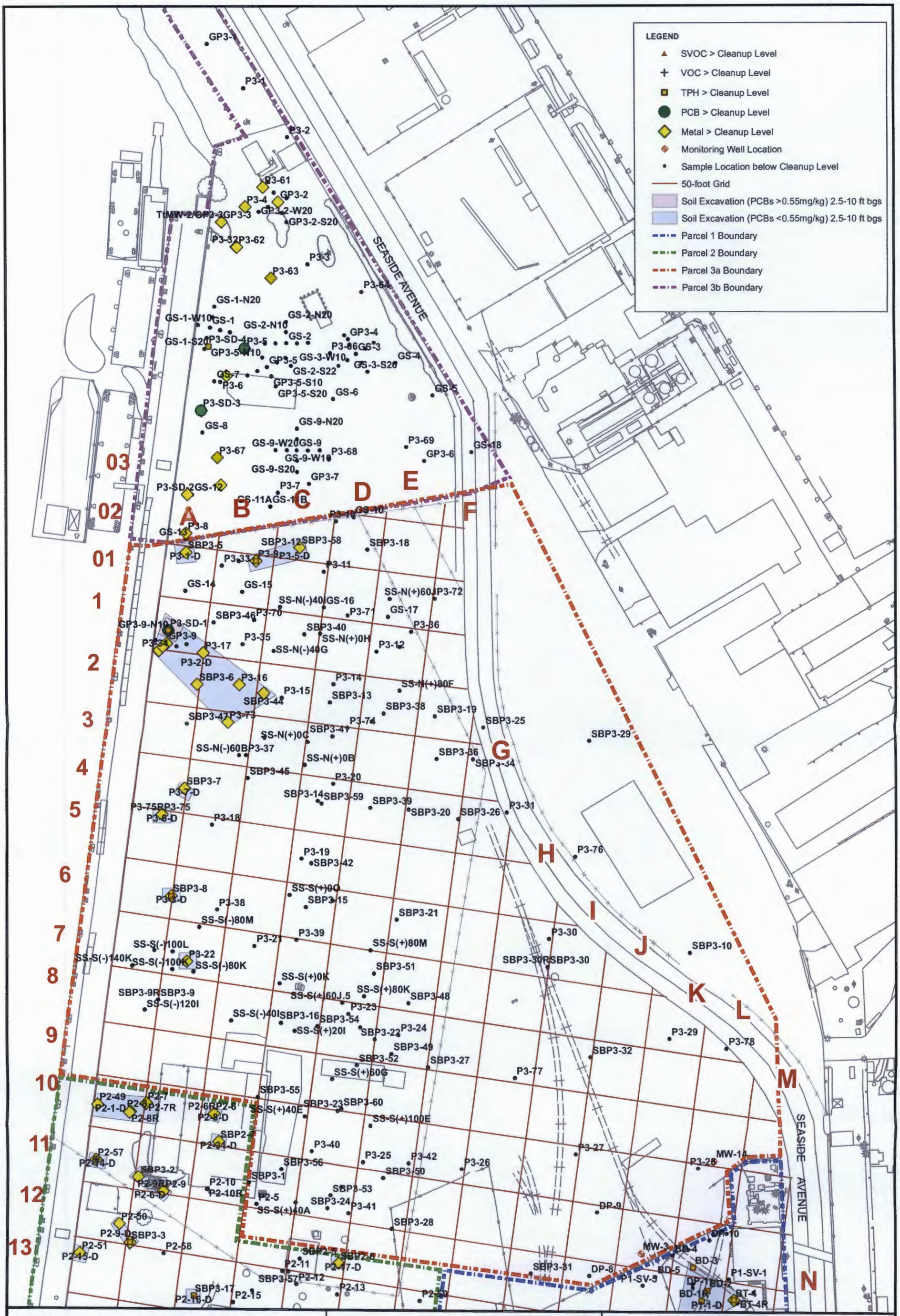
FIGURE 4A



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FORMER SOUTHWEST MARINE FACILITY
TERMINAL ISLAND, CALIFORNIA

PROJECT NO.:	DATE:	DR.BY:	APP. BY:
04-LAP-028	5/28/2014	J. KURASHIGE	P. PARMENTIER

0 50 100 200 Feet

DEEP SOIL AREAS ABOVE CLEANUP LEVELS (PARCEL 3)

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1962 FREEMAN AVE.
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(562) 579-1055

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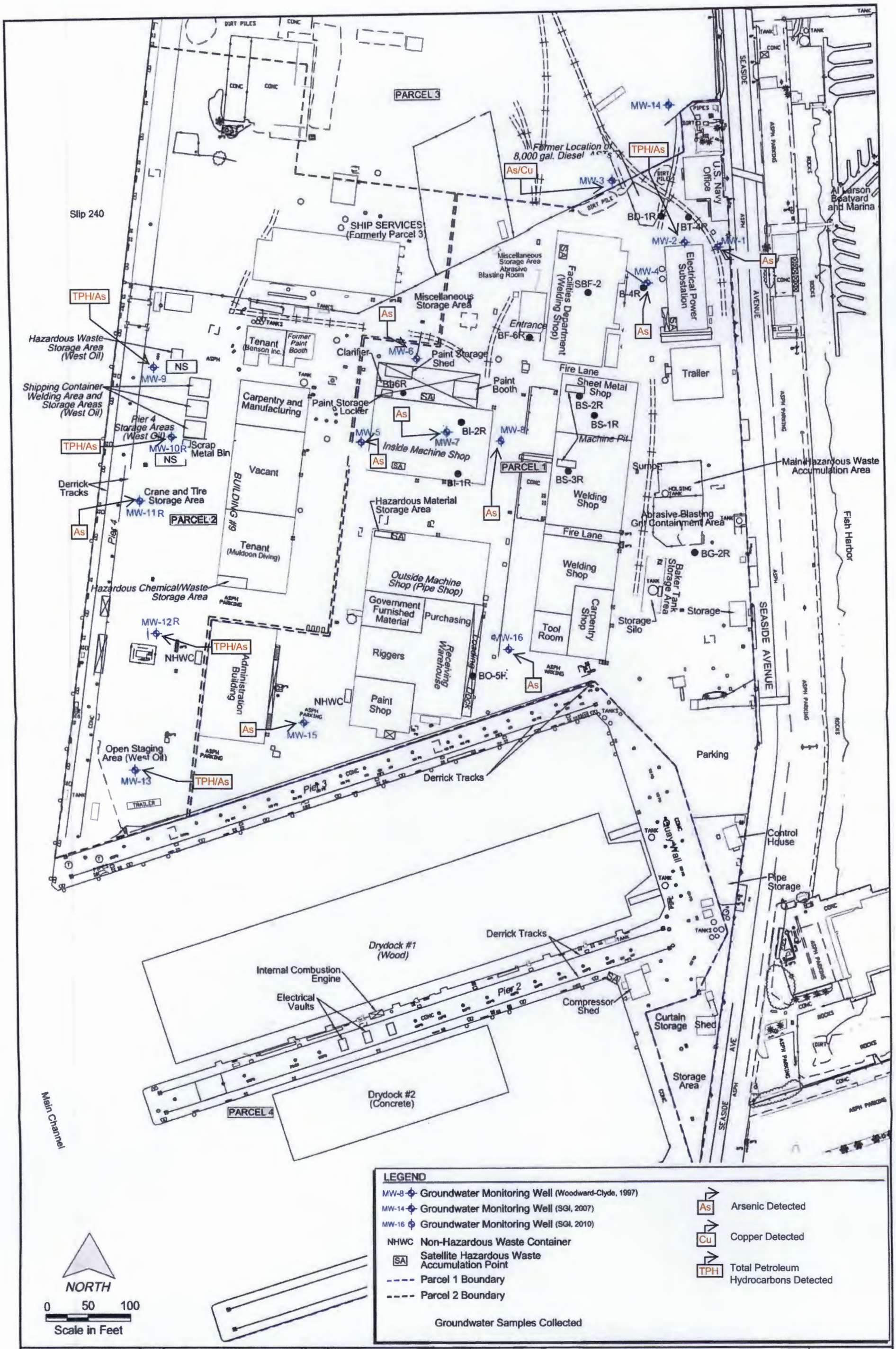
FIGURE 4B



N.I. / CBG / SMF-Q3-10	Prepared By: SGI environmental THE SOURCE GROUP, INC.	Prepared For: Environmental Management Division PORT OF LOS ANGELES 425 South Palos Verdes St. San Pedro, CA 90733-0151	FIGURE 5 GROUNDWATER MONITORING WELLS WITH CONTAMINANTS OF CONCERN CONCENTRATION ABOVE CLEAN UP LEVELS	DATE 05/16/2014 / SCALE 1"=100'

TABLES

Table1
Site-Specific Cleanup Goals for Contaminants of Concern
Former Southwest Marine Facility
985 Seaside Avenue, Terminal Island, California

Contaminant of Concern	Cleanup Goals for Parcels 1, 2 & 3	
	Groundwater (µg/L)	Soil (mg/kg)
Metals		
Antimony	5.0E+03	2.3E+02
Arsenic	1.4E+00	1.2E+01
Barium	2.00E+03	9.4E+02
Cadmium	1.0E+01	1.0E+00
Chromium VI	2.0E+01	3.8E-01
Cobalt	1.00E+01	3.4E+01
Copper	3.0E+01	6.9E+01
Lead	2.0E+01	8.0E+01
Mercury	2.5E-01	6.9E-01
Molybdenum	2.30E+02	4.6E+00
Nickel	5.0E+01	2.2E+02
Silver	1.9E+00	3.8E+00
Zinc	2.0E+02	2.2E+02
TPH		
TPH (C6-C12) purgeable	1.0E+02	1.8E+02
TPH (C9-C25) extractable	1.0E+02	1.8E+02
TPH (C24-C40) extractable	1.0E+02	2.5E+03
VOCs		
Naphthalene	1.4E+01	1.7E-01
Benzene	5.9E+01	2.9E-02
SVOCs		
Phenol	3.00E+02	8.2E-02
Organotin		
Tributyltin Oxide	7.40E-02	1.2E+01
PCBs		
Total PCBs	1.9E-04	5.51E-01
Organochlorine Pesticides		
Toxaphene	2.00E-03	3.1E-03
Dioxins/Furans		
2,3,7,8-TCDD	3.90E-08	5.0E-05

Notes:
µg/L = micrograms per liter
mg/kg = milligrams per kilogram
TPH = Total Petroleum Hydrocarbons
VOCs = Volatile Organic Compounds
PCBs = Polychlorinated Biphenyls
2,3,7,8-TCDD = 2,3,7,8-tetrachlorodibenzo-p-dioxin
SVOCs = Semivolatile Organic Compounds

APPENDICES ON ACCOMPANYING DISK